BiGGAR Economics

Economic Impact of Crown Estate Scotland

A report to Crown Estate Scotland
April 2025

BiGGAR Economics

Contents

1. Executive Summary

Crown Estate Scotland plays a central role in Scotland's offshore economy and plays a strategic role in enabling new and existing sectors.

Since it was established in 2017, Crown Estate Scotland's (CES) goal has been to create lasting value for the people of Scotland. CES manages the Scottish Crown Estate which includes around 50% of the foreshore and seabed out to 12 nautical miles (nm), around 37,000 hectares of land across four estates and minerals rights across Scotland. In addition, on behalf of the Scottish Ministers, it manages the rights of offshore renewables and gas storage to the seabed out to 200nm.

Crown Estate Scotland manages assets, market development opportunities and tenant relationships, in sectors as varied as farming, forestry and mining to aquaculture, offshore wind, tidal and carbon capture and storage to ports and marinas. CES's management places a focus on supporting tenants to achieve their ambitions, taking a holistic approach to development and considering the long-term benefits that each sector can bring.

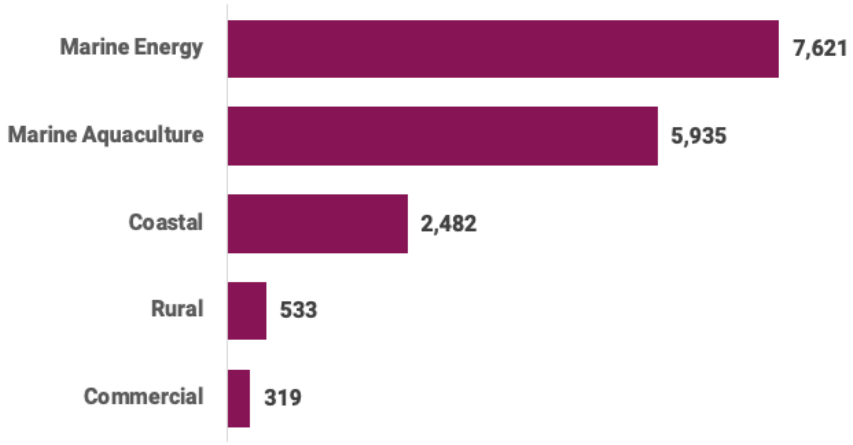
Based on management of the estate CES generated **£37.6 million in income** in 2023-24. A leasing round for offshore wind in 2021 generated additional option fee revenue for 10 years, increasing the annual revenue to £134.9m. The revenue profits (after management and enabling costs are accounted for) are given to the Scottish Government, and some of this is redistributed to coastal local authorities. After excluding ScotWind revenue, 13% of the previous year's gross revenue (after depreciation) was transferred to CES's capital account for reinvestment in the Estate to generate future revenue growth.

The core economic impact of CES in Scotland, which includes its direct impact (including profits and staff costs), spending in the supply chain and spending by staff, was **£134.6 million Gross Value Added** (GVA, a measure of economic activity) and **214 jobs** in 2023.

The tenants that it enables in sectors from farming to offshore wind also generate significant economic impacts. In 2023, it is estimated that this enabled impact was **£2.1 billion GVA and almost 17,000 jobs**. The largest impacts arise from the marine energy (mainly offshore wind), marine aquaculture (particularly salmon farming) and coastal (mainly ports and harbours) sectors.

Creating lasting value for Scotland

Figure 1.1 Enabled Employment by Sector, 2023



Due to CES's leasing activities, CES has a wide network of stakeholder relationships and insights into its sectors. It is seen as a **neutral agent** and uses its central position to build relationships and understanding across sectors. It has the **power to convene** different organisations within and between sectors to increase collaboration and reach agreement. It takes actions to identify and address challenges, make bridging investments and fund sectoral interventions. As a result, it is able to **effectively support the growth of these and related sectors** (e.g. manufacturing related to offshore wind) increasing economic impact.

Its **ScotWind** and **INTOG leasing rounds** have secured significant commitments for the offshore wind sector to spend in the Scottish supply chain (subject to successful project development including obtaining consents, grid connection and securing a highly competitive subsidy mechanism). For each successful project, it is expected jobs in the manufacturing and ports sectors will be created. CES continues to support the sector's development through engagement, coordination and enabling activity focused on the key barriers of consents, grid and future strategy. In areas like wider supply chain investment, CES contributes to the ongoing work of the Scottish Offshore Wind Energy Council and the Strategic Investment Model (SIM).

It is expected that through the offshore wind sector, combined with carbon capture and storage and the tidal sector (wave energy in the longer term), CES could enable **£97.1 billion in investment** over the next 10-15 years. Around a third of this is expected to be secured in Scotland, generating at least **£15.9 billion GVA** and supporting **21,600 jobs annually**. This could increase substantially if the ScotWind ambition scenario is met.

CES aims to secure the long-term value of these sectors, increasing their impact by attracting manufacturers and other industries, creating additional employment. In addition, these sectors will generate economic impacts during their operation, when they are expected to generate **£874 million GVA and 9,700 jobs in Scotland**.

CES works across a range of sectors at its estates, commercial property and Scotland's coasts and seabed, taking a long-term, holistic approach. This is characterised by:

- **strong relationships** with a wide range of stakeholders: due to CES's position as the landowner all actors engage with them;
- a **convening and bridging role**: CES encourages co-ordination and collaboration across organisations, and smooths interaction between sectors;
- a **strategic role**: CES identifies and addresses strategic needs, adds extra capacity and supports the growth of existing and emerging sectors; and
- **long-term and holistic view**: CES focuses on delivering lasting value for the people of Scotland and invests with a view to Scotland's long-term economic prosperity.

2. Introduction

BiGGAR Economics has been commissioned to assess the impact of Crown Estate Scotland and its tenants.

2.1 Background

Crown Estate Scotland (CES) manages the assets of The Crown in Scotland, including agricultural land, commercial real estate and the seabed. It invests in property, natural resources and people to generate lasting value for Scotland.

It was originally part of The Crown Estate, which managed the assets of The Crown throughout the UK, before the management was transferred by the Scotland Act 2016. CES generates the majority of its revenue through its leasing activities and its revenue profit is paid to the Scottish Consolidated Fund, which is transferred to the Scottish Government. Some of this money is then provided to communities where CES operates. In 2023/24, 13% of CES's gross revenue from the previous year (excluding ScotWind and after accounting for depreciation) was transferred to CES's capital account in its Scottish capital assets.

In 2024, BiGGAR Economics was commissioned by CES to assess its direct economic impact as well as the impacts that it enables through its lease agreements with a range of industries, from offshore wind to farming.

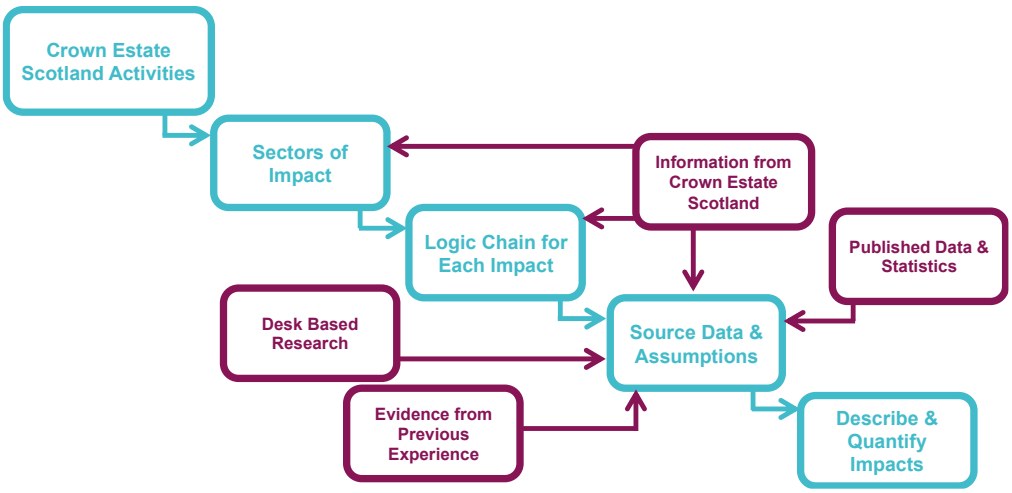
2.2 Methodology

The starting point for estimating the economic impact of CES was to determine its activities and the leases that it holds. This involved a review of background information, including the asset class profiles produced by CES, and consultations with key staff. In this way, the sectors and sources of impact supported by CES were identified (Figure 2.1).

For each of the identified impacts, the way in which CES contributes to the economic activity was assessed, e.g. leasing land or providing access to the seabed, to understand how CES enables other organisations to operate and generate impacts. Where possible, the impacts associated with these tenants have been assessed based on publicly available information and data provided by CES.

For some areas, like offshore wind, CES plays a prominent role in a developing sector and in these cases the future economic impact has been quantified.

Figure 2.1 Logic Chain of CES Route to Impact



Source: BiGGAR Economics

An economic impact model was built to estimate the economic impacts across each of the sectors, which are expressed in terms of:

- **Gross Value Added (GVA)** – this is a measure of economic value added by an organisation or industry. It is typically estimated by subtracting the non-staff operational costs from the revenues of an organisation;
- **Years of Employment:** this is a measure of employment which is equivalent to one person being employed for an entire year and is typically used when considering short-term employment impact, such as construction employment; and
- **Jobs** – this is a measure of employment which considers the headcount employment in an organisation or industry.

GVA and employment figures are estimated based on the ratios between turnover, GVA and employment[1] e.g. for a given level of employment a certain level of GVA would be supported. There would also be wider effects as a result of spending in the supply chain (known as indirect effects) and spending by staff in the wider economy (known as induced effect). These are estimated using Type I (indirect) and Type II multipliers (indirect and induced)[2].

The economic impacts have been presented at the level of the Scottish economy.

2.3 Report Structure

This report is structured as follows:

- section 3 provides background context on the role of CES and the core economic impacts it generates as an employer;

[1] Scottish Government (2024), Scottish Annual Business Statistics 2022
[2] Scottish Government (2024), Scottish Input-Output Tables 2019

- section 4 assesses the economic impacts generated in the marine energy sector;
- section 5 analyses the economic impacts generated in the marine aquaculture sector;
- section 6 outlines the role CES plays in supporting coastal economic activity;
- section 7 details CES's role in generating impacts from the country's rural assets;
- section 8 presents the economic impact CES generates in the built environment through the leasing of commercial and residential properties;
- section 9 summarises the total impact CES supports across the Scottish economy, both directly from its activities and as an enabler of activity of other organisations.

3. Crown Estate Scotland

CES plays an active role in developing sectors and generates economic impacts through its activities.

3.1 The Role of CES

3.1.1 Approach

CES was established in 2017 with the goal of creating lasting value for Scotland.

The main operation of CES is its leasing and lease management across its 21 asset classes (see Section 3.1.2). Many of these leases were inherited from The Crown Estate.

The focus of this activity is coordinating development and supporting tenants to achieve their goals in a commercially viable manner , while balancing the needs of the wider community. The incentives of CES and its tenants are aligned (for example, in some industries rent is paid as a share of production revenues) and this encourages a strong working relationship, as CES and its tenants have shared interests.

CES typically takes a holistic view to new leasing opportunities, including wider social and environmental goals. New leases offer certainty while developers secure permission from the relevant planning authorities/regulatory agencies, reducing risk.

These leasing activities place CES at the centre of its estates and offshore sectors. As manager of the rights to the seabed, securing an option agreement (also referred to as lease option/agreement for lease) is a necessary first step before any development can take place. As a result, CES has relationships with a wide range of actors in Scotland's coastal and marine sectors.

These relationships are valuable for managing leases, which can be highly specialised and rely on a strong understanding of the history of development for a section of coastline (e.g. are cables and pipelines present? Is there a marina or planned bridge development?). CES is able to leverage its experience to navigate these complexities, smoothing development and reducing risk for tenants, and providing unrivalled expertise.

Its central role also means that CES is a repository for information about the relevant sectors. Along with its unique role between the public and private sector, the organisation is able to effectively support the development of certain sectors, identify strategic challenges and opportunities, and co-ordinate between actors. In doing so it takes a long-term view, using its knowledge, connections and funding to increase the scale of associated economic impacts and develop new sectors.

It also improves co-ordination across sectors, by acting as a neutral arbiter, and is perceived as having an impartial view, working in the common interest. For example, in the offshore wind sector it chairs the Strategic Investment Model (SIM) group, which encourages greater collaboration between industry partners.

Due to its commercial funding, it is also able to act in a way that other bodies may be too constrained to do, providing bridging investments (generally receiving minimal yet commercially acceptable returns), adding capacity to emerging sectors and funding studies that no one else is able to commit to in the first instance, stimulating and leveraging further investment. For example, it has funded studies to address strategic challenges in the offshore wind sector (e.g. wet storage, social impact).

These actions are motivated by a commitment to creating lasting value for Scotland. This extends from supporting existing sectors, including farming and aquaculture, to establishing new sectors, such as offshore wind and carbon capture. As well as directly supporting these sectors, CES understands that they form one part of a supply chain and tries to encourage the development of other parts of this supply chain (e.g. attracting manufacturers in the offshore wind sector).

Some of these interventions may not bear fruit for a significant length of time but have the potential to be transformational, exemplifying the long-term, holistic approach to development taken by CES.

Creating lasting value for Scotland

3.1.2 Structure

In 2023/24, CES directly employed an average of 77 staff throughout the year and it has central headquarters based in Edinburgh. It also employs managing agents, who manage the day-to-day operations on the rural estates and work with local tenants to understand their needs.

It operates across a number of different asset classes, which are collected into five main categories:

- Marine (Separated into two Directorates Energy and Infrastructure, and Aquaculture):
    - Offshore wind;
    - Gas Storage (including CO_2 storage);
    - Tidal and wave;
    - Marine cables and pipelines
    - Finfish aquaculture;
    - Shellfish aquaculture; and
    - Seaweed.

- Coastal:
  - Ports and harbours;
  - Marinas and moorings; and
  - Coastal cables and pipelines,
- Rural:
  - Farming;
  - Sporting;
  - Salmon fishing; and
  - Minerals and mines.
- Forestry
- Built Environment:
  - Commercial property;
  - Development property; and
  - Residential.

3.2 Core Economic Impact

The core economic impact associated with CES is the impact related to its operations, including leasing, contract management and strategic development.

3.2.1 Direct Economic Impact

In 2023/24, CES's income was £134.9 million[3], of which the majority is accounted for by revenues from ScotWind. The largest categories after marine energy and infrastructure are Other (£23.1 million, mainly interest), followed by Marine aquaculture (£10.5 million) and Costal (£4.7 million).

Of this income, a total of £112.2 million was paid to the Scottish Government, via the Scottish Consolidated Fund. This is transferred to the Scottish Government and some of this money is then provided to coastal local authorities where CES operates. In 2023/24, 13% percentage of CES's gross revenue from the previous year (excluding ScotWind and after accounting for depreciation) was transferred to CES's capital account to reinvest in its Scottish capital assets.

[3] Crown Estate Scotland (2024), Annual Reports and Account to 31 March 2024

Table 3.1: CES Income in 2023/24

	Income (£m)
Marine (Energy and Infrastructure)	91.4
Marine (Aquaculture)	10.5
Coastal	4.7
Rural	3.9
Commercial	1.3
Other	23.1
Total	**134.9**

Source: CES Annual Report

CES has operating costs of £17.1 million, of which expenditure of around £11 million was incurred on materials and contracting. To estimate direct GVA, the supplier costs were subtracted from income, with an estimated economic impact of £123.8 million GVA.

Table 3.2: Direct Impact of CES, 2023

	Value
Income (£m)	134.9
Supplier Costs (£m)	11.1
Direct GVA (£m)	**123.8**
Direct Employment (jobs)	**77**

3.2.2 Supply Chain Spending Impact

In addition to its direct impact, CES will generate economic impacts in its supply chain. It was estimated that it spent £11.1 million on materials and contracting, including administrative and management costs, and repairs and maintenance. A high proportion of CES's costs are focused on management of its estates and offshore assets, which means that the principle spend is with Scottish contractors. Therefore, it has been assumed that 75% of supplier spend occurs in Scotland.

Applying appropriate economic ratios and multipliers, it was estimated the total economic impact associated with this spending would be £7.7 million GVA and 108 jobs.

Table 3.3: Supply Chain Impact of CES, 2023

	Value
GVA (£m)	7.7
Employment (jobs)	108

3.2.3 Staff Spending Impact

CES's total staff costs were £6.0 million, and staff will generate economic impacts as they spend their salaries in the local economy. It was assumed that 75% of this spending would take place in Scotland. and the spending was adjusted to account for VAT. Therefore, it was estimated that £4.1 million would be spent in Scotland.

Applying ratios and multipliers for the sectors corresponding to household expenditure, it was estimated that this would support £3.1 million GVA and 29 jobs.

Table 3.4: Staff Spending Impact of CES, 2023

	Value
GVA (£m)	3.1
Employment (jobs)	29

3.3 Crown Estate Scotland Summary

Through its leasing and development activities, CES is central to its estates and to offshore sectors such as offshore wind and aquaculture. It manages its contracts to promote the growth of its tenants, in balance with communities, and its primary goal is to create lasting value for Scotland.

It is seen a neutral agent and uses its central position in a number of sectors to build relationships and understanding. As a result, it is able to effectively support the growth of these and related sectors (e.g. manufacturing related to the offshore wind sector) to increase economic impact. It achieves this through increased collaboration, identifying and addressing challenges, making bridging investments and funding sectoral interventions.

Crown Estate Scotland generated **£134.9 million** in income in 2023-24. After subtracting costs, this money is returned to the Scottish Government, which then distributes the money to local authorities and 13% of CES's gross revenues from the previous year (excluding ScotWind and minus depreciation) is transferred to CES's capital account to reinvest.

The economic impact of CES in Scotland, including its direct impact, supply chain spending and spending by staff, was **£134.6 million GVA** and **214 jobs** in 2023.

Table 3.5: Core Impact of CES, 2023

	GVA (£m)	Employment
Direct	123.8	77
Supply Chain	7.7	108
Staff Spending	3.1	29
Total	**134.6**	**214**

4. Marine – Energy and Infrastructure

CES is supporting sectors including the offshore transmission network, the offshore wind sector carbon storage, and tidal sectors through its leasing of the seabed.

4.1 Offshore Wind

One of CES's roles is leasing the seabed for use by the offshore wind sector. This sector combines several elements of how CES operates, including leasing activity, market shaping, supporting industry collaboration and supporting Scotland's long-term economic success.

4.1.1 Leasing

All of Scotland's operational windfarms generating income today were awarded Option Agreements by The Crown Estate prior to the establishment of Crown Estate Scotland in 2017. This includes the operational Robin Rigg Offshore Wind Farm, Beatrice Offshore Wind Farm, Seagreen Offshore Wind Farm, and Moray East and Moray West Wind Farms, as well as Neart na Gaoithe Wind Farm, which is nearing completion at the time of writing. As a result, Scotland has expertise in developing and building offshore wind farms.

Since it was established, CES has held two major leasing rounds for ScotWind and Innovation and Targeted Oil and Gas (INTOG). The results of the ScotWind leasing round were announced in April and October 2022, with 20 projects being awarded Option Agreements.

These ScotWind Option Agreements, which were all located in areas identified by the Scottish Government's Sectoral Marine Plan, were highly sought after and attracted 74 bids. At the time of the Option Agreements being awarded, CES secured £755 million in initial option fees.

These projects, which are expected to take several years to plan and build, have an expected capacity of around 30GW.They also represent a significant increase in Scotland's existing wind capacity, which consists of 3.0GW of offshore wind capacity and 9.8GW of onshore wind capacity. This will dramatically increase the level of renewable energy generated in Scotland if all projects are able to obtain consent, grid connection and revenue support through mechanisms such as Contracts for

Difference (CfD)[4]. It is therefore part of CES's role to work with Scottish Government to ensure there is a market pull for this much green energy in Scotland.

A number of criteria were considered when awarding bids, including experience of the developer, quality of the bid and the proposed level of spending in Scotland, which is outlined in the Supply Chain Development Statements (SCDS). These are discussed in further detail in Section 4.1.2.

In addition to ScotWind, CES also undertook the INTOG leasing round. This consisted of two elements:

- IN – small-scale, innovative projects 100MW or less; and
- TOG – projects connected directly to oil and gas infrastructure to provide electricity and reduce the carbon emissions associated with production.

A total of 12 projects have been awarded Exclusivity Agreements, including 5 IN projects and 7 TOG projects. Innovative projects are important because they will help to trial new technologies in an emerging sector, potentially reducing costs and increasing capacity. TOG projects will help to decarbonise oil and gas infrastructure, which currently generates significant emissions in Scottish waters.

It is anticipated that the INTOG projects will add 5.4GW of additional capacity and will in time provide electricity to consumers as well as oil and gas infrastructure. However, it is noted that in addition to the significant challenges to obtain consent, grid and subsidy support, the TOG projects also have the challenge of obtaining agreements and commitment from the Oil and Gas sector.

4.1.2 Supply Chain Development

The ScotWind and INTOG sites now represent a sizeable opportunity for Scotland. As part of the ScotWind leasing round, developers had to provide a SCDS, which had two scenarios for supply chain spending: the commitment scenario, which set out how much they committed to spend in Scotland, and the ambition scenario, which set out the upper limit for how much they would like to spend. While the SDCSs were not used as evaluation criteria for awarding bids, they demonstrated the potential for supply chain development in Scotland by the offshore wind farms awarded leases. In addition, the SCDS commitments within the commitment scenario are contractually enforced. This relies on the projects being successfully developed through consenting, grid and subsidy.

The largest economic opportunity for Scotland associated with these offshore wind developments is in floating wind. This technology, which has yet to be deployed at scale, will depend on large floating foundations, which are then anchored to the sea floor. Several developers have committed to manufacture these foundations at Scottish ports, and they have the potential to create thousands of jobs during construction.

[4] This scheme guarantees a set price for electricity per unit of power output.

These activities are likely to be in locations, such as the Cromarty Firth and Ardersier, which are in rural areas with limited drivers of economic activity and which have struggled with falling populations. The development of this sector has the potential to attract working people back to these areas and revitalise their economies.

In addition, offshore wind is a developing sector globally in which growth in demand has outstripped the supply of the necessary technologies in recent years. This requires new capacity, which creates an opportunity for Scotland to attract new businesses to take a share of the global market. If Scotland can develop a critical mass of development, it creates an attractive environment for international investors to establish operations in the country and produce high quality components (such as foundation systems, cables, tensions legs etc.), which can then be exported. While the local market needs to be established first, these operations are likely to outlast the ScotWind leasing round and provide the basis for future prosperity.

For example, Sumitomo, a Japanese multinational that manufactures undersea power cables, has broken ground on a £350 million cable factory at the Port of Nigg in Highland. This is expected to directly create around 156 high value jobs, with further jobs in the supply chain. CES played an important role in facilitating this investment (see Section 6.1 on ports and harbours). Similarly, the port at Ardersier is being redeveloped for manufacture of floating foundations and additional projects are likely to be announced as more projects are developed.

By incentivising the development of the Scottish supply chain and supporting the development of an offshore wind project pipeline, CES has contributed to the conditions for Scotland to fully benefit from the development of a new sector that is critical to the transition to net zero.

4.1.3 Industry Coordination and Support

As well as encouraging the sector to develop the Scottish supply chain, CES has taken an active part in supporting the sector's overall growth.

As the owner of the seabed in Scottish waters, CES has close relationships with each of the developers, with meetings every quarter to discuss the challenges that their projects are facing. These conversations are more substantial and honest than they might be with other organisations because CES is trusted and is perceived as not having an agenda beyond wanting to see the sector develop.

The honesty that is brought into these conversations as well as the fact that they take place with all of the developers means that CES is one of the principal organisations in the industry that understands the support that the industry needs and the roadblocks to further development. It also has the resources and the capacity to help the industry overcome these challenges. For example CES has:

- driven forward activity, alongside partners, through the Scottish Offshore Wind Energy Council (SOWEC);
- worked with the industry to map the seabed and other spatial data, reducing development costs and increasing certainty;

- worked with partners such as RenewableUK to develop an Industrial Growth Plan to triple supply chain manufacturing;
- contributed to funding the development of a potential solution to Wet Storage challenges (storage of assembled turbines before they are installed);
- provided £250,000 to the Environmental Interactions Strategic Programme to identify knowledge gaps involving key environmental considerations for the UK's floating wind sector; and
- managed a project to identify the social impacts associated with offshore wind development at ports and other locations.

CES has fostered greater levels of collaboration and knowledge sharing between developers, who also engage through SOWEC. This is a public-private partnership between developers, industry stakeholders, enterprise agencies, the Scottish Government and CES. Based on its position of trust within the sector, CES also chairs the Strategic Investment Model (SIM) group, with the SIM being project managed by the enterprise agencies.

The offshore wind sector requires investments in related infrastructure, such as ports, which will enable them to deliver their projects but which no one actor is able to fund. The SIM pulls together the aggregate demand of developers for services and infrastructure and facilitates engagement between the SIM group developers, investors and project proponents. This can enable strategic investment in projects which are likely to have the biggest impact for the sector as a whole.

CES is able to successfully drive forward interventions to boost the offshore wind sector because it is trusted and independent, has the resources to fund projects and because it has the convening power needed to reach agreement.

4.1.4 Enabled Economic Impact of Offshore Wind

To date, there is around 3GW of offshore wind in Scotland, much of it built recently, with further, significant planned expansion. As a result, in 2023 there was employment across three main phases:

- the development of future offshore wind farms;
- construction of wind farms, including Neart na Gaoithe Offshore Wind Farm, Moray West Offshore Wind Farm and Seagreen Offshore Wind Farm; and
- the operation of existing offshore wind farms

The most comprehensive estimate of the employment in Scotland's offshore wind sector in 2023 is a survey undertaken by the Offshore Wind Industry Council (OWIC)[5]. On this basis, it estimates that across development, construction and operation the Scottish offshore wind sector supported 7,621 jobs directly and indirectly (i.e. supply chain).

While this survey was focused on employment, it is possible to estimate the GVA impact supported based the industry average. A report by the University of

[5] Offshore Wind Industry Council (2023), Offshore Wind Skills Intelligence Report June 2023

Strathclyde's Fraser of Allander Institute[6] considered the GVA and employment supported by Scotland's renewable energy sector in 2021. Using the ratio of GVA to employment, in this report it was estimated that the sector generated £1.2 billion GVA in Scotland in 2023.

Table 4.1: Economic Impact of Offshore Wind

	Value
GVA (£bn)	1.2
Employment (jobs)	7,621

4.1.5 Future Economic Impacts from Development and Construction

The offshore wind industry is widely considered to be one of the biggest potential drivers of the energy transition in Scotland. As discussed in the previous section, CES has played an important role in ensuring that the Scottish economy benefits from this investment.

When the ScotWind leasing round was initially completed, developers planned to build 27.6GW of offshore wind projects across 20 projects. Due to the advances in technology and other developments, this has increased to 31.0GW of offshore wind capacity. The INTOG leasing round could also potentially add around 5.4 GW of capacity, adding to a total of 36.4GW. This will rely on suitable market conditions and the funding environment at the time of the Final Investment Decision (FID).

Table 4-2 Capacity of ScotWind and INTOG Projects

	Projects	Capacity (GW)
ScotWind	20	31.0
INTOG	11	5.4
Total		**36.4**

Source: Supply Chain Development Statements

To deliver this substantial increase in capacity will require significant investment. As part of the ScotWind leasing round, developers provided estimates of the investment associated with their proposed projects. Based on these estimates (and analysis of the data where total costs were not available) it was estimated that developers would spend £78.5 billion as part of the ScotWind leasing round.

The INTOG projects, which are being developed as part of a later leasing round, are also expected to require significant investment (though only one project has supplied an SCDS). Applying costs per MW based on a representative sample of ScotWind projects it was estimated that the investment associated with INTOG would be £17.5 billion.

[6] Fraser of Allander Institute (2023), The Economic Impact of Scotland's Renewable Energy Sector

Combined, these offshore wind projects would require investment of around £96.0 billion. This is equivalent to over 70 Queensferry Crossings, the largest significant investment in Scottish infrastructure in recent years.

Table 4-3 Expected Investment associated with ScotWind and INTOG

	Investment (£bn)
ScotWind	78.5
INTOG	17.5
Total	**96.0**

Source: BiGGAR Economics analysis of Supply Chain Development Statements.

These projects could also result in significant contracts for Scottish businesses. As part of their SCDS, each developer provided commitment and ambition scenarios across their development, manufacturing and fabrication, and installation contracts.

Based on analysis of the ScotWind SCDSs, and applying this to the INTOG projects, it was estimated that Scottish firms could secure contracts worth between £28.6 billion and £34.8 billion. The highest share of contracts is expected to be in development (£3.1-3.7 billion out of £4.8 billion), while the largest opportunity is in manufacturing and fabrication (£18.4-28.9 billion out of £73.8 billion).

Table 4-4 Expected ScotWind and INTOG Scottish spend by SCDS category (£bn)

	Commitment	Ambition	Total
Development	3.1	3.7	**4.8**
Manufacturing and fabrication	18.4	28.9	**73.8**
Installation	7.1	9.3	**17.5**
Total	**28.6**	**34.8**	**96.0**

Source: BiGGAR Economics analysis of Supply Chain Development Statements.

BiGGAR Economics has developed an in-depth model for assessing the economic impact of offshore wind developments, which incorporates data on a range of categories and sub-categories, based on industry analysis[7]. Combining this economic model with the estimates of spending associated with SCDS, it was possible to estimate the direct economic impact associated with ScotWind and INTOG.

On this basis, it was estimated that the spending associated with the development and construction phase could directly support £11.2 billion GVA and 161,500 years of employment in Scotland, and up to £16.5 billion GVA and 240,900 years of employment in the ambition scenario.

[7] BVG Associates (2024), The Online Guide to a Floating Offshore Wind Farm

Table 4-5 Direct Economic Impact of ScotWind and INTOG

	GVA (£bn)	Years of Employment
Development	1.7	26,500
Manufacturing and fabrication	7.3	106,100
Installation	2.2	28,800
Commitment Total	**11.2**	**161,500**
Ambition Total	**16.5**	**240,900**

Source: BiGGAR Economics analysis of Supply Chain Development Statements.

In addition to the direct impact associated with these projects there will also be indirect impacts (e.g. spending in the supply chain). In line with industry best practice, the direct and indirect impacts have been summed, which suggests that the total economic impact in Scotland would be £15.7 billion GVA and 229,900 employment years under the commitment scenario, and £23.2 billion GVA and 343,100 years of employment.

While there is a great degree of uncertainty about when these projects are likely to take place, modelling over a 10-year time construction period suggests that the peak annual impact will be £1.4-2.2 billion GVA and 21,200-32,100 jobs in Scotland.

Table 4-6 Total and Peak Impact of ScotWind and INTOG

	GVA (£bn)	Years of Employment
Direct	11.2	161,500
Indirect	4.5	68,300
Total Commitment	**15.6**	**229,900**
Peak Commitment	*1.4*	*21,200*
Total Ambition	**23.2**	**343,100**
Peak Ambition	*2.2*	*32,100*

4.1.6 Future Economic Impacts from Operations and Maintenance (O&M)

In addition to the economic impact associated with development and construction, the projects being developed as part of ScotWind and INTOG will also generate economic impacts during their operations and maintenance (O&M) phase.

Based on the data provided as part of the SCDSs, it is anticipated that the annual spending associated with ScotWind and INTOG projects will be £2.0 billion. Of this it is anticipated that £1.4-1.5 billion could be secured in Scotland.

Table 4-7 Annual O&M spend associated with ScotWind and INTOG

	Commitment	Ambition	Total
ScotWind	1.15	1.27	**1.70**
INTOG	0.23	0.26	**0.35**
Total	**1.38**	**1.53**	**2.05**

Source: BiGGAR Economics analysis of Supply Chain Development Statements.

Applying the same methodology as for development and construction, it was estimated that the annual economic impact in Scotland associated with O&M would be £698 million GVA and 9,500 jobs under the commitment scenario and £772 million GVA and 10,600 jobs under the ambition scenario.

Table 4-8 Annual O&M Impacts associated with ScotWind and INTOG

	Commitment	Ambition
Commitment		
Direct	498	6,600
Indirect	200	2,900
Total	**698**	**9,500**
Ambition		
Direct	550	7,300
Indirect	222	3,200
Total	**772**	**10,500**

4.2 Carbon Capture and Storage

4.2.1 The Role of CES

Carbon capture and storage (CCS) is a proven process, which involves directly capturing the carbon dioxide (CO_2) emissions associated with fossil fuel power generation and industrial processes that would otherwise be difficult or impossible to decarbonise and storing those emissions. The process is identified in the Committee on Climate Change, and UK Governments path to net zero as being 'critical' to achieve the UK and Scotland's legally binding net zero targets.

Scotland has a unique opportunity to benefit from CCS because :

- the area's geology is well-known with large underground caverns that could be filled with excess CO_2 (Scotland has 75% of the UK's storage capacity);
- there is extensive gas-related infrastructure, such as pipelines; and
- there is a large workforce with high levels of expertise, even as oil and gas production is slowing.

If the UK commits significant financial support to the continuation of CCS development and can create a market for decarbonised industrial activity, Scotland has the natural storage capacity and skills to deliver this. This opportunity may grow if Scotland creates a market route for other countries to export their CO_2 to Scotland and/or set up carbon-intensive industries to benefit from the transport and storage infrastructure.

CES has delegated responsibility through the Energy Act and the Carbon Dioxide Management Act to manage the seabed rights for Gas Storage in the Gas and Importation Zone (out to 200nm). CES is one of the key stakeholders in the development of the carbon storage element of the process. It continues to work with other key stakeholders, including the Scottish Government and the North Sea Transition Authority (NTSA), to shape the market and create long-term economic benefits for Scottish businesses.

CES's extensive engagement with other marine users is also important in managing interactions, such as those with existing cables and pipelines, e.g. the offshore wind sector. It has also signed a lease agreement for a section of the seabed with Acorn CCS, which is based at the St Fergus Gas Terminal on the Aberdeenshire coast.

In 2019, CES commissioned the Centre for Energy Policy at the University of Strathclyde to assess the potential economic impacts associated with CCS, which highlighted the role that could be played in safeguarding existing jobs in carbon-intensive industries.

CES has also engaged with the public and private sector to highlight the role that the CCS could play in attracting inward investment, for example from companies in carbon-emitting industries moving to Scotland and taking advantage of its geography. This would significantly increase the economic impacts associated with the technology.

4.2.2 Future Economic Impacts from Development and Construction

While CCS is a proven process, commercially there is no market in the early stages because decarbonisation costs for products and services that directly or indirectly use oil and gas (e.g. petrol, plastics and medicine). Therefore, subsidy support is needed to set up the necessary infrastructure.

The Acorn cluster is one of four projects that has been selected to advance by UK Government. It is centred around Aberdeenshire and requires both a seabed agreement from CES (they currently hold an Option Agreement) and a storage permit from the NSTA to store captured carbon within the seabed under the North Sea.

Analysis undertaken by the Centre for Energy Policy at the University of Strathclyde, which was funded in part by CES, has considered the potential economic impacts associated with transport and storage in Scotland and the UK, with a particular focus on the Acorn Cluster[8]. This analysis considered two scenarios, including one where

[8] Centre for Energy Policy (2024), A New Scottish CO_2 Transport and Storage Sector

the UK becomes a hub for CCS, importing and storing emissions from other countries.

It considered the investment required to build the transport and storage infrastructure alone and estimated that the investment required would be £582 million. While the economic impact has not been estimated, applying the ratio of investment to GVA and employment from analysis undertaken on the Acorn Cluster (including other investments such as hydrogen production)[9], suggests that this could generate £149 million GVA and 326 years of employment in Scotland. Assuming a three year construction time period, this would support £50 million GVA and 109 jobs annually.

Table 4-9 Economic impact of Investment associated with CCS

	Total	Annual
GVA (£m)	149	50
Employment	326	109

4.2.3 Future Economic Impacts from O&M

As part of the work by the Centre for Energy Policy the potential operational impacts associated with the Acorn Cluster were also considered. On this basis, it estimated that the annual economic impact associated with Acorn would be £167 million GVA and 133 jobs. The very high GVA per employee ratio (about £1.25 million GVA per job) reflects the high capital intensity of the project.

Table 4-10 Annual Direct Economic impact associated with CCS

	Scotland
GVA (£m)	167
Employment (jobs)	133

In addition to the direct economic impact associated with CO_2 transport and storage, it will also enable a range of sectors to capture and store their carbon, including for power generation (e.g. Peterhead), oil and gas processing, blue hydrogen (derived from natural gas) and big industrial processes (such as cement production). This has the potential to safeguard employment in these industries.

BiGGAR Economics has undertaken analysis on behalf of the Acorn Cluster[10], which considered the total impact associated with CCS, including transportation and storage and safeguarded employment in companies that may otherwise close due to their CO_2 emissions. This found that the process could directly support employment

[9] BiGGAR Economics (2024), The Scottish Cluster – Capturing the Economic Potential
[10] BiGGAR Economics (2024), The Scottish Cluster – Capturing the Economic Potential

of 2,300 jobs in the Scottish economy and safeguard up to 12,100, while generating 4,700 jobs annually during the development and construction phase.

4.3 Wave and Tidal

4.3.1 Role of CES

Wave and tidal energies are emerging technologies that have been primarily developed off the Scotland's north coast, particularly in the Pentland Firth between mainland Scotland and the Orkney Islands.

CES's role is in providing access to seabed in a fair and transparent way. An Option Agreement (or equivalent for other sectors) can provide certainty to developers and de-risk further project investment. CES funds enabling work including research, such as a recent report which considered how tidal energy projects could directly supply coastal communities and generate hydrogen without needing a grid connection. This report, undertaken by the European Marine Energy Centre (EMEC) and the Offshore Renewable Energy (ORE) Catapult, helps to underline the potential economic opportunity and encourage creative thinking in the transition to net zero.

CES's most significant involvement in the sector came in 2014 when it invested £9.8 million in Meygen, which was one of the first deployed tidal energy developments in the world. It is a 6MW demonstrator project, which, once fully developed, has the potential to generate up to 398MW Meygen has been awarded CfD support for a further 59MW. This project has been instrumental in supporting the development of the tidal sector, which is also being driven forward by EMEC in the Orkney Islands.

Wave energy development is at earlier stage of development with single prototype testing, largely at the EMEC facility, and supported by the Scottish Government-funded Wave Energy Scotland programme.

4.3.2 Future Economic Impact – Development and Construction

There are several potential Scottish tidal projects that have secured CfD support, with a total capacity of 86MW. Based on the estimated costs of a small tidal project (about £5.5 million per MW)[11] it was estimated that the total spend associated with this new development would be £460 million.

A recent study estimated that the economic impacts in Scotland during the development and construction phase could be equivalent to 15.4 jobs and 860,000 GVA per MW[12]. There are expected to be opportunities in Scotland associated with the turbine manufacture and installation.

On this basis, it was estimated that the economic impact in Scotland during the development and construction phase would be £71 million GVA and 1,278 years of

[11] Frazer Nash Consultancy (2023), A Review of Technical Assumptions and Generation Costs
[12] Bianchi, M.; Fernandez, I. F. (2024), A systematic methodology to assess local economic impacts of ocean renewable energy projects: Application to a tidal energy farm.

employment. Assuming a construction period of four years, this would support an average of £18 million GVA and 320 jobs annually.

Table 4-11 Economic impact associated with Development and Construction of Tidal Energy

	Total	Annual
GVA (£m)	71	18
Employment	1,280	320

4.3.3 Future Economic Impact – Operation and Maintenance

As with the development and construction of tidal projects there is limited evidence on their operational impact. A 2012 Environment Impact Assessment on behalf of Meygen[13] found that for an 86MW development, it was anticipated that 50 people would be employed.

Assuming that the level of employment per MW would be consistent across the time period, this suggests that the proposed projects would directly employ around 50 people during the O&M phase. Applying relevant sector multipliers suggests that the economic impact would be 75 jobs. Assuming that these jobs are in the engineering sector and applying relevant multipliers suggest an economic contribution of £9 million GVA.

Table 4-12 Economic impact associated with Operation and Maintenance of Tidal

	Total
GVA (£m)	9
Employment (jobs)	75

4.4 Summary of Marine - Energy and infrastructure Impacts

CES has a key role to play in the marine energy sector. It designed the ScotWind and INTOG leasing rounds, encouraging and facilitating the development of the offshore wind sector and the Scottish supply chain. Using its unique position and relationships with all developers, it has actively enabled and supported increased collaboration, funded a range of studies and attracted inward investment. The ScotWind and INTOG leasing rounds are expected to add an additional 36.2GW of offshore wind capacity in Scotland.

[13] Roger Tym and Partners (2021), Meygen Environmental Impact Assessment – Chapter 21

The organisation also supports the early-stage CCS sector, developing information used by the sector and supporting studies to highlight the potential benefits. It has invested directly in the Tidal sector through MeyGen, the largest tidal project in the UK, and continues to support the sector, for example funding research.

Across these sectors, Scotland has the potential to become a leader in an emerging sector, anchoring long term value creation through the location of manufacturing and other related sectors.

4.4.1 Enabled

In 2023, there were several operational wind farms as well as a number that were in development and construction. It was estimated that the economic impact associated with these projects was £1.2 billion GVA and 7,621 jobs in Scotland.

Table 4-13 Marine Energy: Enabled Impact, 2023

	GVA (£m)	Jobs
Offshore Wind	1,188	7,621

Source; BiGGAR Economics Analysis

4.4.2 Enabled Future Capital

It is anticipated that there will be significant investments of £97.1 billion made in the offshore energy sector in the future, particularly in the offshore wind sector. This is expected to generate significant economic benefits of at least £15.9 billion GVA and 231,500 years of employment in Scotland, though this may increase if Scottish companies secure a higher share of investment.

Table 4-14 Marine Energy: Enabled Future Capital Impact

	Investment (£bn)	GVA (£bn)	Years of Employment
Offshore Wind	96.1	15.7	229,900
CCS	0.6	0.1	326
Wave and Tidal	0.5	0.1	1,278
Total	**97.1**	**15.9**	**231,504**

Source; BiGGAR Economics Analysis

It is anticipated that this will result in at least an additional £1.5 billion GVA and over 21,600 jobs each year, mainly from offshore wind investment.

Table 4-15 Marine Energy: Annual Enabled Future Capital Impact

	GVA (£m)	Jobs
Offshore Wind	1,450	21,200
CCS*	50	110
Wave and Tidal*	18	320
Total	**1,517**	**21,620**

Source; BiGGAR Economics Analysis. *Note, these investments will happen over a shorter time period.

4.4.3 Enabled Future Operational

Once operational, the supported investments will also generate annual economic impacts. It is anticipated that this will generate £874 million GVA and 9,730 jobs each year of operation.

Table 4-16 Marine Energy: Enabled Future Operational Impact

	GVA (£m)	Jobs
Offshore Wind	698	9,520
CCS	167	130
Wave and Tidal	9	80
Total	**874**	**9,730**

Source; BiGGAR Economics Analysis

5. Marine – Aquaculture

CES's aquaculture tenants generate substantial economic impacts, supporting rural, coastal areas and generating significant exports.

5.1 Finfish Farming

5.1.1 The Role of CES

Finfish farming (predominantly salmon) is a large established sector in Scotland. It is the UK's largest food export and is predominantly based on the west coast and islands.

CES's main role is in leasing and contract management. Each site requires a lease with CES, which have operated in the sector since it developed in the post-war period. CES has strong relationships with each of the large multinational companies that make up the sector.

When a new site is being considered CES determines which company will take up the lease based on a list of criteria, including the strength of the business model and environmental commitments, ensuring a competitive process that benefits the sector and local areas. Once a lease option agreement has been reached developers have a grace period of up to three years to arrange the appropriate permits and planning applications, helping to derisk the investment.

Following a root and branch review in 2022, CES introduced new reporting requirements across a range of areas, including sea lice levels and plastics usage, and it publishes a report on what a good tenancy should look like, including areas such as encouraging good stewardship and good relationships with neighbours. CES is able to introduce this type of reporting because it has developed a good working relationship with the industry, resulting in high levels of compliance and collaboration.

A particular area of focus has been on equipment management. Older equipment can become damaged and detach from fish farms, leading to issues for other marine users whose own boats and equipment can become tangled. It can also have a visual impact on local people.

CES has developed an inventory reporting system to identify missing or damaged equipment, is working with developers to reduce pollution and navigation risks. This highlights the unique ability of CES resolve issues, as decommissioning of equipment is an area where in the past it had been difficult to reach a consensus, leading to local tensions.

In addition to working directly with industry, CES also has good engagement with stakeholders such as NatureScot, local authorities and the Scottish Environmental Protection Agency (SEPA), and sits on several monitoring groups. This has included helping to manage an aquaculture portal, including inputting spatial data so that there is a central point of data capture for the sector.

It has also funded a post at Fisheries Management Scotland (FMS), which is managing and improving the relationship between the fish farming sector and wild salmon advocates, in part mediated by CES. These groups have often had a contentious relationship and this post has helped to build trust and mutual understanding. This is expected to lead to improved environmental outcomes.

5.1.2 Enabled Economic Impact

The fish farming sector is one of the largest employers on Scotland's west coast and islands, areas which typically lack significant employment drivers and may have relatively fragile and low-paid economies.

BiGGAR Economics has previous experience modelling the economic impacts of aquaculture in Scotland, producing a tool in 2020 for Marine Scotland. The tool uses data on the production volume of finfish farmed and the published accounts of production companies to estimate the total value generated by the sector. A full description of the methodology used in this assessment can be found on our website.[14]

Based on the most recent company accounts and production volumes produced by the Scottish Fish Farm Production Survey, finfish production in Scotland generated £475.0 million GVA and 5,581 jobs.

Table 5-1 Economic impact associated with Finfish farming

	Scotland
GVA (£m)	475.0
Employment (jobs)	5,581

In addition to the direct production, there are also jobs in the processing sector, which contributed an estimated £227 million GVA and around 5,000 jobs in 2023.

5.2 Shellfish Farming

Scotland's shellfish sector produces a range of high-quality seafood, including mussels and oysters. Much of this is produced by relatively small-scale producers on the west coast and particularly in the Shetland Islands, providing high quality jobs in rural and island communities. The sector is very sustainable since shellfish are a

[14] https://biggareconomics.co.uk/the-economic-contribution-of-the-scottish-aquaculture-sector

good source of protein while producing minimal CO_2, they purify the water, and they increase biodiversity.

CES's main role in the sector is providing and managing site leases, of which there were 270 in 2022. It applies similar criteria as for finfish farming, including the strength of the business case. CES has also helped the sector to grow through funding a Scottish shellfish marketing post, providing strategic direction and coordination to a sector comprised of small producers.

This enabling role drives the development the Scottish shellfish brand, which is prized abroad, and increasing consumption in Scotland, which has traditionally been lower than in other European countries despite its high production levels. This has included identifying the barriers to increasing shellfish consumption in Scotland, social media campaigns and sharing recipes in places such as the Asda Good Living magazine and the Saturday Kitchen, a cooking show.

The economic impact of shellfish production can be assessed using the tool created for Marine Scotland in 2018. In the same way as set out for finfish farming, the tool was updated to account for the most recent input data and estimated that, in 2023, the sector generated an economic contribution worth £17.4 million GVA and 295 jobs to the Scottish economy.

Table 5-2 Economic impact associated with Shellfish Farming

	Scotland
GVA (£m)	17.4
Employment (jobs)	295

5.2.1 Seaweed

Seaweed farming is a growing sector on Scotland's coast. Seaweed can be used in a number of products, including food, as a feed stock for plants and animals, in pharmaceuticals and cosmetics, and in a range of innovative sectors such as plastics.

Currently the sector is relatively small scale, with around 8,000 tonnes of wild seaweed harvested in 2020 by a handful of small or micro-companies engaged in wild seaweed harvesting or seaweed farming. While they are developing expertise in their core business, they have limited capacity and expertise to increase the size and sophistication of the sector as a whole, limiting growth. In addition, the sector's relatively underdeveloped infrastructure and long timelines for generating a return create uncertainty, which deters further investment.

CES has taken steps to address this by funding a position at the Scottish Seaweed Industry Association, which is focused on increasing co-ordination across the sector (e.g. through conferences, nurturing relationships etc.) and developing seaweed as a high value Scottish brand.

The majority of the companies that have been supported are based on Scotland's north and west coasts and the islands, so the sector supports areas that may have more fragile economies. In addition, there are likely to be opportunities in the sector's supply chain and downstream opportunities in processing, distribution and marketing.

Based on a report by the Scottish Government in 2020, it generates an annual economic impact worth £510,000 GVA, and directly employs 59 people. It is estimated that there are around nine related businesses in the sector. CES enables this economic activity and plays a part in facilitating further growth in the sector.

Table 5-3 Economic Impact associated with Seaweed

	Scotland
GVA (£m)	0.5
Employment (jobs)	59

The seaweed sector has significant growth potential, which would lead to growing importance in the future, in part supported by CES's activities. As part of the report for the Scottish Government, the potential growth was assessed. On this basis, the total economic impact could increase to £11.5 million GVA and 130 jobs per year in 2040.

Table 5-4 Future Economic Impact associated with Seaweed

	Scotland
GVA (£m)	11.5
Employment (jobs)	130

5.3 Summary of Marine – Aquaculture Impacts

CES provides and manages leases for both the finfish and shellfish aquaculture sectors, which operate very differently. It ensures that its finfish tenants maintain environmental standards, reducing potential pollution, as well as encouraging greater cooperation with relevant authorities such as SEPA and funding a post at FMS to build relationships with the salmon fishing sector. It has also helped to develop the brand of the Scottish shellfish aquaculture sector through a funded marketing post. CES is providing support to the growing seaweed sector, funding a position to develop the Scottish seaweed brand and increasing industry coordination.

In 2023, these three sectors had a combined economic impact of £492.9 million GVA and 5,935 jobs (which does not include downstream processing). An assessment of

the Scottish seaweed sector suggests that its value could grow to £11.5 million GVA and 130 jobs by 2040.

Table 5-5 Marine: Enabled Impact of CES, 2023

	GVA (£m)	Jobs
Finfish Farming	475.0	5,581
Shellfish Farming	17.4	295
Seaweed	0.5	59
Total	**492.9**	**5,935**

Source; BiGGAR Economics Analysis

6. Coastal

CES manages coastal assets, including ports and harbours, marinas and moorings, and cables and pipelines.

6.1 Ports and Harbours

Ports and harbours provide vital infrastructure for Scotland's offshore economy, such as fishing and offshore wind, and are the main gateways for the import and export of goods that support onshore industries. In addition, they provide key infrastructure for connecting Scotland's rural and island communities.

These ports and harbours are located on the foreshore/seabed, where they have leases with CES, and investments, such as quay expansions, require CES's agreement to proceed.

In addition, CES stimulates investment in ports, and port-related infrastructure, to support the blue economy. Whilst it cannot directly invest in specific projects, it can enable projects to occur by acquiring the land to release equity or equipment required and inducing further investment. As CES is recognised as a long-term (e.g. 10 years) investor, this provides other potential funders with security, lowering project risk and increasing the likelihood of investment.

One such example of this work in practice was the role CES took to enable investment by Sumitomo at the Port of Nigg. CES was at the heart of a 'Team Scotland' effort to secure this project. It stepped in to buy the key parcel of land needed for the cable factory and then played a pivotal role in the negotiations required to get the project started. This effort, which included significant involvement from the Scottish Government and Highlands and Islands Enterprise, will support significant local economic activity and up to 156 direct jobs in the Highlands.

Part of its success is due to CES accepting a lower, yet still commercially viable, internal rate of return (4.5%) than private funders would typically expect to generate from investments. This ensures that the organisation remains commercially viable whilst enabling projects to go ahead without losing too much capital in the process, thus safeguarding employment and societal goals are achieved.

Another such example is Scapa Flow, where a deep-water quay facility is proposed. This would support activities associated with Scotland's offshore wind sector and generate economic activity. CES will work in collaboration with Orkney Islands Council as the project progresses

6.1.1 Enabled Economic Impact

Based on publicly available data, such as news reports and annual reports from Companies House, and estimating impacts where data was unavailable, it was estimated that the major ports in Scotland employ 1,225 people and have a turnover of around £289 million.

Applying the appropriate economic ratios for the sector it was estimated that the direct GVA impact was £198 million. Applying appropriate economic ratios and multipliers it was estimated the sector had an annual economic impact of £326 million GVA and 2,037 jobs

Table 6-1 Economic impact associated with Ports and Harbours

	Scotland
GVA (£m)	326.3
Employment (jobs)	2,037

In addition, a 2023 report by the British Ports Association, 'Gateways for Growth', assessed the wider economic impact of Scottish ports. It estimated that in 2022, Scottish ports supported a total of 49,202 jobs across the country, including those related to the transport of people and freight and generated an economic contribution worth £1.5 billion GVA[15].

6.2 Other Coastal

6.2.1 Marinas and Moorings

CES manages the seabed out to 12nm and around 50% of the foreshore. It therefore has agreement with many of marinas and all moorings across Scotland. By reviewing and granting agreements in Scotland, CES plays a role in ensuring that coastal activities are in line with standards and regulations and operate in ways which support local communities.

As of 2022, CES had 816 agreements in place and 775 tenants. In the same year, a study commissioned by CES found that expenditure associated with moorings generated an annual economic impact worth £12.8 million GVA to the Scottish economy and supported 445 FTE jobs[16].

[15] https://www.britishports.org.uk/content/uploads/2023/06/BPA-Scottish-Ports-Gateways-for-Growth-2023-1.pdf

[16] https://www.crownestatescotland.com/sites/default/files/2023-07/moorings-socio-economic-assessment.pdf

Table 6-2 Economic Impact associated with Marinas and Moorings

	Scotland
GVA (£m)	12.8
Employment (jobs)	445

A notable example of CES's role in supporting marinas and moorings is in the £500,000 funding made available to the Corpach Marina in Fort William. This enabled the marina to raise additional funding from other funders, and the marina now has increased berthing capacity, new onshore facilities and a community coffee shop, generating long-term employment.

6.2.2 Cables and Pipelines

CES provides and manages leases for cables and pipelines that come ashore in Scotland (this section includes both coastal and marine cables and pipeline). This includes data and power cables that connect Scotland, particularly rural and island communities, to the rest of the world, and pipelines that bring oil and gas onshore.

The focus of this activity is mainly on contract management, ensuring that new developments, including aquaculture and energy, do not interfere with existing infrastructure.

In recent years, CES has supported a growing focus on repurposing existing gas infrastructure, which is likely to be decommissioned as the industry slows, for use in carbon capture and hydrogen. This would take advantage of Scotland's significant renewable energy potential to produce hydrogen that can be stored and transported via pipelines.

In addition, in 2021 CES (along with the Scottish Futures Trust and Scottish Enterprise) funded a study of Scotland's potential for data centres[17]. Pointing to Scotland's natural advantages, such as its mild climate and renewable energy production, the report identified a long list and a short list of potential data centre sites. These would utilise the data cables for which CES provides the lease .

6.3 Summary of Coastal Impacts

CES's main coastal tenants are ports and harbours, which play a vital role as infrastructure, supporting the fishing and energy sectors, acting as the gateway for the import and export of goods, and helping to connect rural and coastal areas. CES helps to attract investment to these ports, connecting ports with sectors such as offshore wind and providing bridging investment to support domestic and foreign direct investment.

[17] TechRE (2021), Longlist for Data Centre Site Development

It also provides and manages leases to marinas and moorings, which are used extensively for leisure use, and the cables and pipelines sector, which is vital to communication and the oil and gas sector.

In 2023, these sectors had a combined economic impact of £340 million GVA and 2,540 jobs in Scotland.

Table 6-3 Coastal: Enabled Impact of CES, 2023

	GVA (£m)	Jobs
Ports and Harbours	326.3	2,037
Marinas and Moorings	12.8	445
Total	**339.6**	**2,541**

7. Rural

CES's estates generate economic activity in rural areas through its farming, forestry, shooting and other tenants.

7.1 Farming

7.1.1 The Role of CES

CES has four estates across Scotland, which includes Fochabers (in Moray), Glenlivet (in Highland), Applegirth (Dumfries and Galloway) and Whitehills (Midlothian). Its goal is to help farmers grow their businesses sustainably. To do this it embraces a long-term view of how it can add value to its estates and to tenant's businesses.

Across its four estates there are 91 agricultural businesses, including arable farming and dairy farming, with the majority of tenancies focused on raising livestock. While day to day management is done though experienced managing agents, CES regularly engages with its tenants through the Farm Tenant Forum, which it holds twice a year providing an opportunity for tenants to discuss their future plans and provide feedback. There is also a Tenant Working Group which meets three to four times a year, which focuses on how CES can help farmers to address more general challenges.

CES has in place the Sustainable Farming Initiative, a programme where it and its managing agents work with farmers to develop business plans and identify support that would be beneficial. This includes providing (or directing to) consultancy support on how they can take advantage of schemes, such as those focused on biodiversity gain, that may be difficult for farmers to access but provide new revenue sources.

In recent years, CES has had a significant programme of investment in building and renovating farm buildings and infrastructure that are no longer fit for purpose. Rather than simply fixing an old building, these investments consider holistically what the farm needs based on the business plan. This may include replacing old buildings with new multi-purpose buildings that facilitate other types of activity or new infrastructure, such as silage pits.

This has helped some businesses to diversify into new areas. For example, CES has funded investments such as solar panels and biomass boilers, with tenants paying increased rent to cover the cost or CES receiving part of the income. Similarly, it has built buildings that can be used for multiple purposes, including events and education.

Many rural farmers also benefit from its Sustainable Communities Fund, which has provided Community Capacity Grants (for those within 5km of its estates or the coastline) and Environment Grants (for tenants) with a value of £1.4 million since 2020. This has included the creation of ponds and hedgerows, boosting biodiversity, as well as walking and cycling infrastructure.

CES's long term vision also applies to its leasing system. Its tenancies are often highly sought after and it applies a weighting system for determining which tenders are the best, including the strength of the business plan and their environmental credentials.

The organisation proactively targets new entrants, in some cases providing a stepping stone for young farmers looking to move into the industry, who also receive strong support to develop. This has positive knock-on effects for the local area, as these farmers often have families that use local facilities (such as schools) that may otherwise be unfeasible.

7.1.2 Enabled Economic Impact

CES currently operates 223 tenancy agreements across its four rural estates (Glenlivet, Applegirth, Fochabers, and Whitehills). These are occupied by 90 businesses/families (some of whom have multiple tenancies across the estates) and account for 21,941 hectares of land. These are broken down as follows:

- Applegirth Estate: 55 tenancies, 19 businesses, and 5,136 hectares;
- Fochabers Estate: 64 tenancies, 31 businesses, and 3,715 hectares;
- Glenlivet Estate: 98 tenancies, 36 businesses, and 12,281 hectares; and
- Whitehills Estate: 8 tenancies, 4 businesses, and 808 hectares.

Of all the businesses, 49% are categorised as mixed land farming and 34% are for livestock. Dairy and arable farming account for 14% collectively.

Data provided by CES indicates that around 285 people are employed on-site (non-CES related). The direct impact of farming activity on CES estates was estimated by applying the Scottish GVA per job for the crop and animal production, hunting and related services sector. Accounting for the indirect and induced effects of this output, the total economic activity supported is around £30.0 million GVA and 464 jobs across Scotland.

Table 7-1 Economic Impact associated with Farming

	Scotland
GVA (£m)	30.0
Employment (jobs)	464

7.2 Sporting

CES has four rural estates and grants the right to on-site sporting activities, such as fishing or shooting. This supports local tourism activity and provides revenue for CES to re-invest.

Of the 37,000 hectares of the rural estate, 3,432 hectares are used for sporting activity, typically shooting of grouse or deer. This type of recreational activity supports employment on-site and supports income for the estates.

Previous work on the economic impact of rural sports activity on estates, by BiGGAR Economics, estimates that the average income per hectare generated by sporting activity is £18 and the average hectares per job is 3,284. Applying those assumptions to the 3,432 hectares used on CES estates for rural activity, it was estimated that the direct impact of sporting activity on-site is £25,000 GVA and 1 job.

Accounting for the indirect and induced effects, using multipliers derived from previous work analysing the sector by BiGGAR Economics, estimates that the total economic impact generated by sporting activity on CES estates is around £40,000 GVA and 2 jobs.

Table 7-2 Economic Impact associated with Sporting

	Scotland
GVA (£m)	<0.1
Employment (jobs)	2

7.3 Forestry

CES directly manages 4,794 hectares of commercial forestry land across its rural estates.[18] As a landowner, CES enables activity in the sector that supports the local and national economy through the harvesting of timber on-site.

Based on previous work produced by BiGGAR Economics, the average jobs per hectare in forestry was applied to the 4,794 hectares of forestry land managed by CES. On this basis, it was estimated that this supports 5 direct jobs.

Applying the GVA per job ratio for the forestry and logging sector it was estimated that the direct GVA supported by forestry on CES estates was £0.2 million. Applying indirect and induced multipliers for the sector indicates that the total economic impact supported is approximately £0.4 million GVA and 10 jobs.

[18] CES Annual Report 23-24

Table 7-3 Economic Impact associated with Residential Accommodation

	Scotland
GVA (£m)	0.4
Employment (jobs)	10

CES also invest in the land to expand forestry cover and initiatives and promote on-site recreational activity for the general public. This helps to ensure the long-term sustainability of the asset, supporting natural capital accumulation. It also supports human capital accumulation by facilitating educational visits and working with local colleges.

7.4 Other Rural

7.4.1 Salmon Fishing

CES are responsible for granting rights to wild salmon fishing across parts of the country and in 2022 there were 120 agreements in place across 60 rivers. This happens across rural estates and supports local activity on-site, primarily from local angling associations. CES support this activity in a way that aligns with conservation legislation, protecting the country's natural capital stocks.

7.4.2 Minerals and Mines Royal

CES controls the rights over mining on the land that it owns as well as the right to extract gold and silver in specific sites throughout Scotland (subject to planning and landowner consent).

CES currently has a number of leases, particularly for sand, gravel and landfill, as well as options to develop mines. There are 28 people employed at these sites. Applying economic ratios and multipliers for the mining and waste collection sectors, it was estimated that these sites supported £9.8 million GVA and 58 jobs (mining is a highly capital-intensive sector with high levels of GVA).

Table 7-4 Economic Impact associated with Minerals and Mines Royal

	Scotland
GVA (£m)	9.8
Employment (jobs)	58

7.4.3 Other Rural

As well as renting out land to be farmed at its estates or leases to mine, CES also has tenants who engage in other sorts of activities.

The estate operates leases to the Lecht Ski Centre and Tomintoul craft units. It also leases to Bike Glenlivet, which operates a mountain biking centre on the Glenlivet

Estate, including bike trails, zip-wire trails, a cafe and bike hire. As well as supporting direct employment, this is a tourist attraction that brings people to the local area.

CES has also contributed to developing the areas around the estates that it operates. In collaboration with partners. It funded the Tomintoul and Glenlivet Landscape partnerships to help regenerate the area, including refurbishing the Tomintoul Discovery centre and developing new paths. CES is currently in the Stage 2 of its Glenlivet Estate 2050 project, which aims to identify how the estate can support local jobs, attract the next generation, improve the environment and address the climate emergency and nature crisis.

7.5 Summary of Rural Impact

A range of activities takes place across the rural estates. CES takes a considered approach to its farming tenants, engaging with them extensively, helping them to develop business plans and making investments that align with their needs. It also encourages new entrants as an element of its leasing activities.

CES also has forestry and sporting activities that take place on its estates, generating economic impacts and supports other rural activities such as mining, salmon fishing and the operation of tourism businesses.

In 2023, it was estimated that the activities of CES's rural tenants generated an economic impact of £40.3 million GVA and 533 jobs in Scotland.

Table 7-5 Rural: Enabled Impact of CES, 2023

	GVA (£m)	Jobs
Farming	30.0	464
Sporting	<0.1	2
Forestry	0.4	10
Other Rural	9.8	58
Total	**40.3**	**533**

8. Built Environment

CES owns commercial property in Edinburgh and leases residential accommodation at its rural estates.

8.1 Commercial Property

CES operates lease agreements to commercial organisations who occupy the properties, including six leases based in Edinburgh at 39/41 George Street and one based in Greenock. The organisations that lease the properties generate economic activity from their day-to-day activities.

Of these seven organisations, five are office-based organisations, operating in sectors such as information services, professional services, administration and energy. The other two are in retail. Employment data provided by CES and, where necessary, supplemented by accounts on Companies House indicate that the organisations leasing commercial property from CES directly employ 193 people.

Based on sectoral ratios for each of the organisations, it was estimated that, collectively, the seven organisations have a turnover of around £42 million. In the same way, applying appropriate sectoral ratios on the average GVA per job estimates that the organisations generate a direct GVA of £17 million for the Scottish economy.

Applying appropriate sectoral multipliers to both the direct employment and GVA to assess the indirect and induced effects, it was estimated that the total economic activity supported by organisations leasing CES commercial property is around £32 million GVA and 320 jobs.

Table 8-1 Economic Impact associated with Commercial Property

	Scotland
GVA (£m)	32
Employment (jobs)	320

8.2 Residential

CES estates are also home to a number of residential properties. These are typically occupied by tenants of the farm (either as part of the tenancy agreement in the form of farmhouses/cottages or separately as a direct residential let) or are sub-let by farm tenants to others.

By providing property for others to let, CES supports residential accommodation in rural areas. CES also invests in its property portfolio and is actively working to improve the energy efficiency of its properties, including an ongoing programme of solar PV installations.

There are currently 68 residential properties on CES rural estates, the majority (81%) of which are distributed between Applegirth and Fochabers Estates. Residents of these households contribute to the local economy through their day-to-day spending, such as on groceries, utilities, recreation, and retail, thus supporting local businesses turnover and employment.

Data produced by the Office for National Statistics (ONS)[19] estimates that the average weekly expenditure for households in the UK is £568, of which £106 is attributed to household costs. This gives an average annual household expenditure of £24,024 (exclusive of housing costs). Applying this to the let properties, this implies that households living in CES rented property spend £1.3 million each year.

Applying this to economic ratios for household spending suggests that the direct economic impact of this spend is £0.6 million GVA and 5 jobs. Applying both indirect and induced multipliers, it was estimated that the economic impact generated by household spending of CES tenants was £1.0 million GVA and 10 jobs.

Table 8-2 Economic Impact associated with Residential Accommodation

	Scotland
GVA (£m)	1.0
Employment (jobs)	9

8.3 Summary of Built Environment Impacts

CES owns commercial real estate in Edinburgh and elsewhere in Scotland, where its tenants generate economic impacts. It also leases residential properties on its rural estates, providing housing in rural areas with limited capacity.

It was estimated that in 2023 the economic impact of its tenants' activities in the built environment generated £33 million GVA and 328 jobs in Scotland.

Table 8-3 Built Environment: Enabled Impact of CES, 2023

	GVA (£m)	Jobs
Commercial	32.4	319
Residential	1.0	9
Total	**33.4**	**328**

[19] ONS, (2024). Family spending in the UK: April 2022 to March 2023.

9. Summary

CES enables significant economic impact, which is likely to increase in the future.

9.1 Core Economic Impact

Based on its leasing activities, CES generated £134.9 million in income in 2023-24, the majority from offshore wind option fees. Most revenue (after accounting for operating costs) is provided to the Scottish Government, which distributes some of the money to local authorities. In 2023/24, 13% percentage of CES's gross revenue from the previous year (excluding ScotWind and after accounting for depreciation) was transferred to CES's capital account to reinvest in its Scottish capital assets.

The core economic impact of CES in Scotland, which includes its direct impact, spending in the supply chain and spending by staff, was £134.6 million GVA and 214 jobs in 2023.

9.2 Enabled Economic Impact

Through leasing, CES provides access to its assets for a range of sectors as varied as farming, forestry, mining to aquaculture, offshore wind, tidal and carbon capture and storage to ports and marinas and commercial activities.

Across these activities it was estimated that in 2023, CES enabled economic impacts of £2.1 billion GVA and 16,890 jobs. The largest contributor to this was the marine energy sector (predominantly offshore wind), followed by the aquaculture sector (mainly salmon farming) and coastal (mainly ports and harbours).

Table 9-1 CES: Enabled Impact, 2023

	GVA (£m)	Jobs
Marine Energy	1,188	7,621
Marine Aquaculture	493	5,935
Coastal	339	2,482
Rural	40	533
Commercial	32	319
Total	**2,093**	**16,890**

9.3 Future Enabled Economic Impact

In addition to the enabled economic impacts in 2023, there will be future economic impacts related to significant capital investments of £97.1 billion in sectors supported by marine energy sectors, particularly offshore wind.

Around a third of this is expected to be secured in Scotland, generating significant economic benefits of around £15.9 billion GVA and 231,400 years of employment in Scotland, though this may increase if Scottish companies secure a higher share of investment.

Table 9-2 CES: Enabled Future Capital Impact

	Investment (£bn)	GVA (£bn)	Years of Employment
Offshore Wind	96.0	15.6	229,800
CCS	0.6	0.1	330
Wave and Tidal	0.5	0.1	1,280
Total	**97.1**	**15.9**	**231,380**

Source; BiGGAR Economics Analysis

On an annual basis, these impacts are expected to peak at £1.5 billion GVA and over 21,600 jobs, mainly from offshore wind investment.

Table 9-3 Crown Estate Scotland: Annual Enabled Future Capital Impact

	GVA (£m)	Jobs
Offshore Wind	1,450	21,200
CCS*	50	110
Wave and Tidal*	18	320
Total	**1,517**	**21,620**

Source; BiGGAR Economics Analysis. *Note, these investments will happen over a shorter time period.

Once operational, the supported investments will also generate annual economic impacts. It is anticipated that this will generate £874 million GVA and 9,730 jobs each year of operation.

Table 9-4 CES: Enabled Future Operational Impact

	GVA (£m)	Jobs
Offshore Wind	698	9,520
CCS	167	130
Wave and Tidal	9	80
Total	**874**	**9,730**

Source; BiGGAR Economics Analysis

9.4 Conclusion

While working across a range of sectors at its estates and commercial property and Scotland's coasts and seabed, CES takes a long-term, holistic approach to developing its tenants' economic impacts. This has been characterised by:

- **strong relationships** with a wide range of stakeholders: due to CES's position as the landowner all actors must engage with them;
- a **convening and bridging role**: CES encourages co-ordination and collaboration across organisations, and smooths interaction between sectors;
- a **strategic role**: CES identifies and addresses strategic needs, adds extra capacity and supports the growth of existing and emerging sectors; and
- **long-term and holistic view**: CES focuses on delivering lasting value for the people of Scotland and invests with a view to Scotland's long-term economic prosperity.

BiGGAR Economics, Shandwick House,
67 Shandwick Place, Edinburgh, Scotland EH2 4SD

info@biggareconomics.co.uk

biggareconomics.co.uk